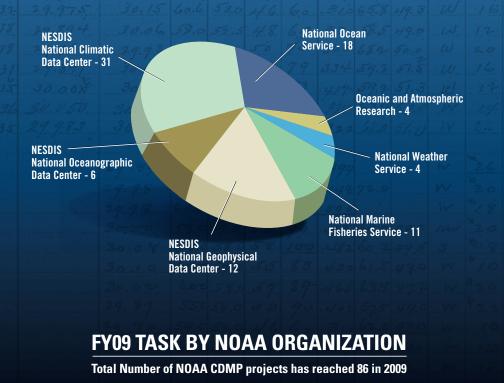
# EDMP 10 YEARS

CLIMATE DATABASE MODERNIZATION PROGRAM Annual Report 2009

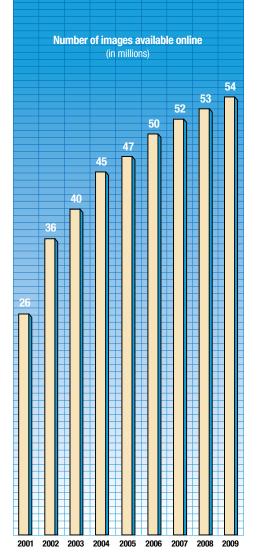
National Oceanic and Atmospheric Administration National Environmental Satellite, Data, and Information Service National Climatic Data Center Asheville, North Carolina Having just completed its tenth year, CDMP continues to support every NOAA line office by preserving and enhancing the availability of valuable climate and environmental data. These data are used by researchers and others dealing with climate and environmental issues crucial to our planet and our global society.



#### **CDMP – A Decade of Achievement**

How time flies! The National Oceanic and Atmospheric Administration's Climate Database Modernization Program (NOAA's CDMP) has just completed its tenth year. When the program began in the year 2000, the demand for rapid and complete access to the Nation's and world's climate data by researchers and global change scientists was a key motivation in the establishment of CDMP, which is managed through NOAA's National Climatic Data Center (NCDC) located in Asheville, NC. This program was initiated by Congress to assist NOAA in modernizing and improving access to the Nation's climate data and information.

A decade later, that demand for climate data access has, if anything, increased. In addition, CDMP has expanded its support across all of NOAA, preserving and making available environmental data ranging from the ocean floor to the top of the ionosphere. Partnering with four private sector contractors, CDMP has placed online over 54 million weather and environmental images, available to researchers around the world via the Internet. The amount of data online has grown from 1.75 terabytes in 2001 to 12 terabytes in 2009. Major progress continues in making these data available through a number of NOAA web sites (see URL list on inside back cover). In addition. hourly weather records keyed through CDMP continue to be integrated into NCDC's digital database holdings, extending the period of record for many stations back into the 1800s. The increase in the quality and quantity of historical data is helping researchers worldwide to improve real-time monitoring and forecasting of environmental, solar and geophysical events.













# **Supporting NOAA's Stewardship Commitment**

The Climate Database Modernization Program supports NOAA's mission to collect, integrate, assimilate and effectively manage Earth observations on a global scale, ranging from atmospheric, weather, and climate observations to oceanic, coastal, and marine life observations. Many of these holdings, which are part of the U.S. National Archives, were originally recorded on paper, film, and other fragile media, and stored at various NOAA Centers. Prior to CDMP, not only were these valuable data sources mostly unavailable to the scientific community, but storage technology for the archives was not state-of-the-art. Without proper preservation of the media, the information they contained was in danger of being lost forever.

As CDMP celebrates its tenth anniversary, the program has greatly improved the preservation and access to NOAA's holdings by migrating many of these resources to new digital media. Digital images of many of the holdings are now available online, and millions of historic data records have been keyed and integrated into digital databases. CDMP projects span the full spectrum of NOAA, supporting all five line offices. CDMP also works with U.S. regional climate centers, state climatologists, the U.S. Air Force, the World Meteorological Organization, and foreign meteorological services in Europe, Africa, Asia, and the Americas. These NOAA efforts benefit researchers and data users throughout the Nation and worldwide. The increase in data accessibility and the inclusion of these historical data sets into the integrated global databases needed by today's climate and environmental data users support the CDMP mission: to make major climate and environmental databases available via the World Wide Web.

### **Major CDMP Tasks 2009**

Hourly Surface Observations: imaging, keying

#### **National Climatic Data Center**

Daily Cooperative Observations: imaging, keying
Upper-Air Observations: imaging, keying
Signal Service/Smithsonian Obs ("Forts"): keying
Integrated Inventory System Development
Marine Observations: keying
Mexican Daily/Hourly Data: imaging, keying
Vietnamese Hourly Data: keying
Snotel Data: keying
East India Company Data: keying
Navajo Nation Data: keying
Station History & Metadata Development
Subscription Services

#### **National Marine Fisheries Service**

Historic Fish Landing Data: keying
Historical Plankton Data Rescue: keying
Historical Alaskan Groundfish and Bering Sea Crab data: keying
Historical Fisheries Data Rescue in the Northeast U.S.: imaging,
keying, audio conversion

#### **National Oceanographic Data Center**

NOAA Library Rare Climate Publications: imaging
Oceanographic Metadata Archeology Project: imaging, keying
California Marine Ecosystem Survey: imaging, keying
Lightship Data from Finland and Sweden: imaging, keying

#### **National Weather Service**

African Upper-Air Observations (seven nations): keying
Surface & Upper-Air Data from South & Central America: imaging, keying
Tropical cyclone "storm wallets": imaging

#### Office of Oceanic and Atmospheric Research

U.S. Navy Weather Station Index Books: keying
Hurricane Reconnaissance: imaging, streaming video
European Historical Ship Logbooks: imaging, keying
Surface Data for San Cristobal, Galapagos Islands: Imaging, keying

#### **National Geophysical Data Center**

Historic International Polar Year: imaging

Defense Meteorological Satellite Program Film: imaging
Glacier Photos: imaging
Marine Geophysical Records: imaging, keying
lonospheric Observations: keying
Historical Solar and Spectral Observations: imaging
Tsunami Event Gauge Records: imaging, keying

Marine/Lacustrine Record of Climate Change: imaging
Heat Mapping Mission Data: imaging
Historic Cosmic Ray Ionization Chamber Data: imaging, keying
Historical International Polar Year: imaging

#### **National Ocean Service**

Shoreline Charts: vectorizing

Nautical Charts: imaging

Thunder Bay Historical Collections: imaging, keying

Historical Maps and Nautical Charts: geolocation

Historic Environmental Sensitivity Maps: imaging

Fish Commission Historical Papers/Logbooks: imaging, keying

High/Low Water Level at NOS Sites: imaging, indexing, keying

Special Reports for Geographic Names: imaging

Historical Aerial Photography: imaging

#### **U.S. Regional Climate Centers**

Database Conversion and Quality Control

# Data Modernization

Before we look to CDMP's future, let's take a moment to reflect on the program's first decade of success. We invite you to fold out these two pages to view a time line of CDMP's contributions and achievements over the last ten years.



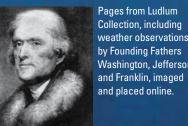
Daily weather maps from as far back as the 1870s scanned.



Surface airways observational forms dating from 1949 imaged in 2000. Imaging and keying of pre-1949 data begins in 2001.



Historic glacier photographs from 18th and 19th centuries imaged.

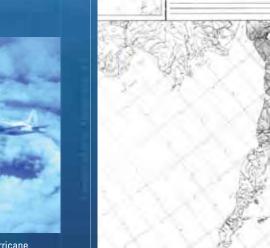


Pages from Ludlum ollection, including by Founding Fathers lashington, Jefferson,



itization of hurricane reconnaissance film collection begins.

2004



Arctic Sea Ice Charts scanning begins.

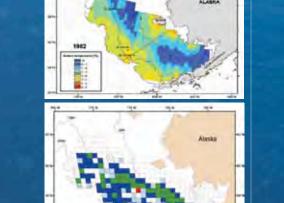


Satellite photos of Middle east natural gas flares imaged.

2007



Historic photos from Hurricane Camille (hurricane storm wallet project).



CDMP-keyed data augment database of

Bering Sea crab populations.

2008

Navajo Nation and Galapagos Islands surface data keying begins.

C AZ Adomand Wit

Elevation (m)



Historic photos of Hawai'ian tsunami damage imaged.



Tropical cyclone storm wallets from Joint Typhoon Warning Center arrive at NCDC.

**2009** 

# 2000-2001

Photos documenting porpoise, dolphin and whale popula-



Defense Meteorological Satellite Program nighttime light imagery scanned.

tions are imaged (National Marine Fisheries Service). Initial historical NCDC publications placed online (e.g. Monthly Weather Review, Monthly Climatic Data, Climatological Data, etc.)





2002

GIS vectorization begins for Shoreline Vectorization Project.

2003

Samples from historic Forts Data, meteorological

records from 1700s and 1800s keying begins.

Surface and upper air data imaging and keying from Africa and Central and South America.

Imaging and keying of Marine logbooks

and lightship data begins; data from

global oceans dating to 1700s.



Upper air data and books from Baghdad, Iraq imaged and keyed.



Underwater images from REEF Environmental Education scanned.

2005



California marine ecosystem projects begin.



Scanning of solar flare and

sunspot imagery begins.



Satellite imagery/chart of zooplankton biomass.

Keying of historical plankton data begins.

Imaging begins on historic 19th century Thunder Bay Sanctuary Research Collection.



Scans of weather observations by George Washington Carver uploaded to NOAA Central Library website.





Scanning of Ocean floor seismic mapping and imagery begins.



Keying begins for historical fisheries data rescue in the Northeast U.S.













# **Looking to the Future**

The Climate Database Modernization Program – or more precisely, the outstanding group of people that make it work – has clearly accomplished a great deal in the last decade. But the mission of CDMP is far from accomplished. In many ways, the work has just begun.

In 2009, the number of NOAA projects supported through CDMP reached an all-time high of 86 tasks. Most of these are multi-year projects, and many are, for all intents and purposes, barely underway. Without continued support through CDMP, these projects would be left incomplete, and valuable climate and environmental data would be left undiscovered and unavailable to the scientific community.

The task of modernizing NCDC's vast archive of weather and climate data continues. While millions of records have been imaged, about a third of the paper documents held by NCDC, and much of its microfilm and microfiche archive, remains unscanned. Accompanying this imaging task, keying of many of the scanned images is ongoing, further supplementing NCDC's digital data resources. At the current pace, there are still years of work ahead to image and key the remaining archived NCDC data.

Ongoing CDMP projects involving other agencies within NOAA are also expected to extend well into the program's second decade. Work continues with NOAA's National Hurricane Center and Atlantic Oceanographic and Meteorological Laboratory to digitize historical hurricane reconnaissance data and "storm wallet" collections; the first of these datasets are already being utilized by hurricane specialists and storm researchers. Several projects with the National Ocean Service and National Marine Fisheries Service are making available rare historical nautical charts, plankton databases, shoreline data, fish surveys in Alaska,

and much more. CDMP-produced images of historical glacier photographs via the National Geophysical Data Center have already made global headlines, with more photos still to be digitized. International cooperation through the National Weather Service is bringing valuable African, Asian, and South American climate data into global databases, and CDMP is actively involved with the World Meteorological Organization's Commission for Climatology. And that short list barely scrapes the surface of CDMP's ongoing service.

Of course, that's just the current CDMP agenda. To further extend the program's mission, additional proposals are solicited and, funding permitted, accepted each year. Just this year, nine new tasks were added to the docket, with still more proposals recently submitted for 2010 consideration at CDMP's annual proposal workshop.

Just because these projects are new doesn't make them any less valuable. One project started in 2009 is expanding the digital database of northwest Atlantic fisheries, extending hydrographic and plankton databases for this area back in time, and providing invaluable data on how environmental change and extensive fishing have impacted fish stocks in the Atlantic. Two additional tasks will digitize rare surface weather observations from data-sparse areas in the southwestern U.S. in Navajo Nation and from San Cristobal in the Galapagos Islands, providing more data to help initialize and verify vital climate change models. Still another new project will digitize rare aerial photography of our Nation's coastlines from as far back as the 1920s, helping coastal scientists better understand how erosion and other factors have impacted our beaches and shorelines.

In short, the people associated with CDMP are proud of the program's accomplishments over the last ten years. But they also know that it's only the beginning. There's a new decade beckoning, and the CDMP mission to make climate and environmental data more accessible is still underway.









## **NOAA's CDMP Project Partners**

The CDMP could not exist without the extraordinary efforts of people within NOAA and those in the private sector who do the keying, imaging, and database development. CDMP projects have created hundreds of new private sector data entry and information management jobs in several economically challenged areas in West Virginia, Kentucky, and Maryland. The project tasks supported by CDMP are well suited for the private sector. Many of these tasks have been shifted from government employees to CDMP contractors in the above mentioned states. Tasks performed by these contractors include the printing and distributing of the NCDC serial climate publications, managing accounts receivable, imaging and keying incoming records, hosting and maintaining online images, and providing expert personnel in support of various projects.

The three prime contractors for CDMP are National Interest Security Company LLC, Rocket Center, West Virginia; SourceCorp, Mount Vernon, Kentucky; and HOV Services, Beltsville, Maryland. Excellent support is also provided by the NCDC on-site contractor, STG Corporation, whose staff prepares many of the data for shipment and performs extensive quality control on the returning data products. With over 85 projects ongoing, the contractors must remain focused and flexible to meet each project's requirements.

# **Web Addresses for NOAA Organizations:**

Climate Database Modernization Program www.ncdc.noaa.gov/cdmp.html

National Oceanic and Atmospheric Administration (NOAA) www.noaa.gov

NOAA's National Environmental Satellite, Data, and Information Service (NESDIS) www.nesdis.noaa.gov

NOAA's National Climatic Data Center (NCDC) www.ncdc.noaa.gov

NOAA's National Geophysical Data Center (NGDC) www.ngdc.noaa.gov

NOAA's National Oceanographic Data Center (NODC) www.nodc.noaa.gov

NOAA's National Ocean Service (NOS) oceanservice.noaa.gov

NOAA's National Marine Fisheries Service www.nmfs.noaa.gov

NOAA's National Weather Service www.nws.noaa.gov

NOAA's Office of Oceanic and Atmospheric Research www.oar.noaa.gov

# **Web Addresses for Selected CDMP Projects**

Oceanographic and Meteorological Laboratory's Atlantic Hurricane Research Division www.aoml.noaa.gov/hrd

National Hurricane Center's "Storm Wallet" Tropical Cyclone Archive www.nhc.noaa.gov/pastall.shtml#wallet

National Marine Fisheries Service COPEPOD Global Plankton Database http://www.st.nmfs.noaa.gov/plankton

**Defense Meteorological Satellite Program Earth Observation Group** www.ngdc.noaa.gov/dmsp/index.html

NOAA Central Library's Digital Documents and Maps Collections www.lib.noaa.gov/collections/imgdocmaps/index.html

National Snow and Ice Data Center Glacier Pairs nsidc.org/data/glacier\_photo/repeat\_photography.html

Northwest Fisheries Science Center's Marine Mammal Image Library www.nwfsc.noaa.gov/resources/killer\_whale/index.cfm







